East Stoneham Quadrangle, Maine

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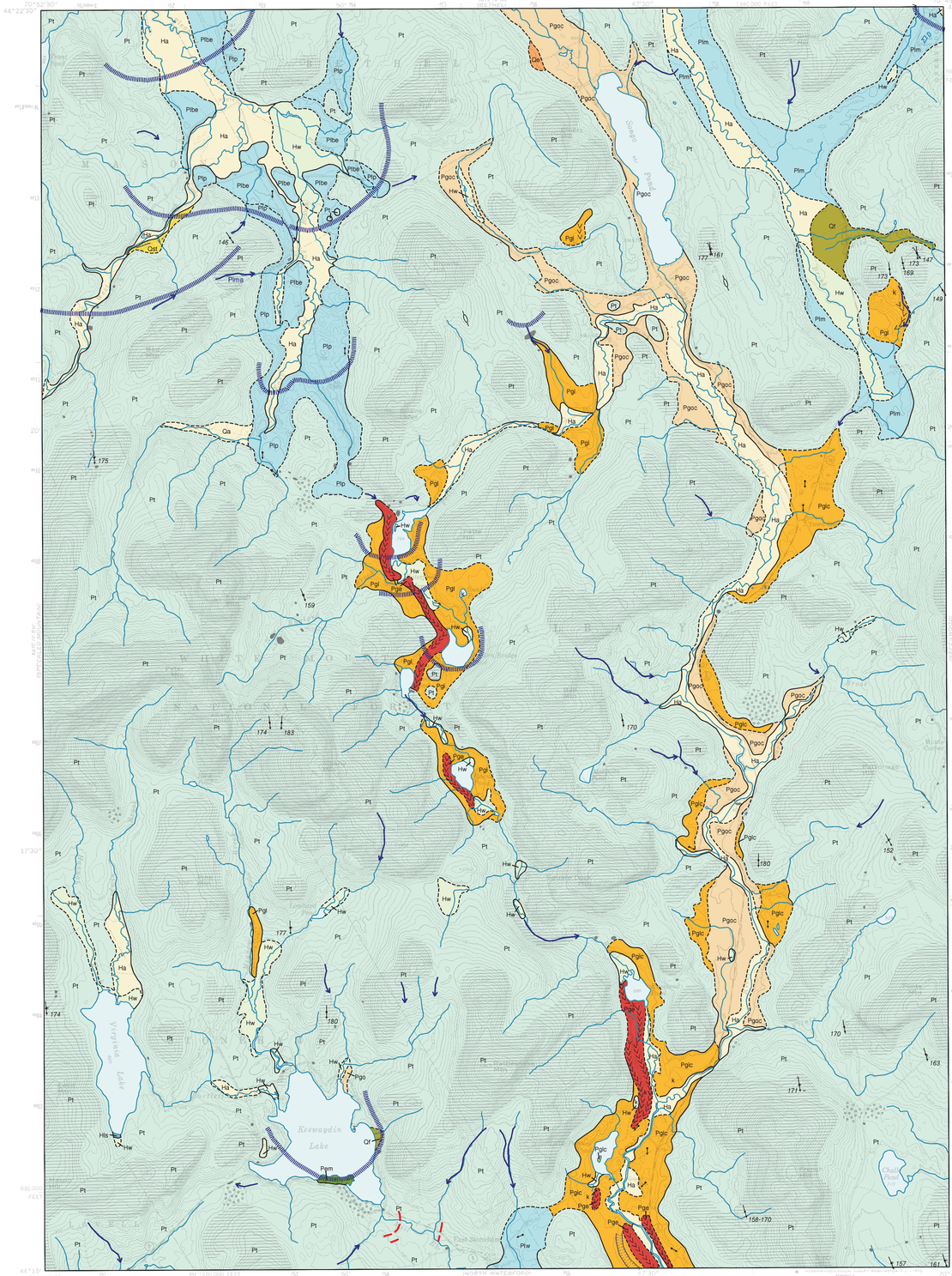
For additional information,
see Open-File Report 03-4.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping of the East Stoneham quadrangle was conducted by Woodrow B. Thompson in 1983 for the Maine Geological Survey's sand and gravel aquifer mapping program and in 2001 and 2002 for the STATEMAP program. This map was funded from the MGS / USGS STATEMAP cooperative (award no. 01HQAG0090).

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey East Stoneham quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Stream alluvium - Sand, gravel, silt, and organic sediment. Deposited on flood plains of modern streams. Unit includes some wetland areas.

Wetland deposits - Peat, muck, silt, and clay. Deposited in poorly drained areas. Unit may include and be underlain by stream alluvium.

Lake shoreline deposit - Modern sand beach at south end of Virginia Lake.

Stream alluvium - Sand and gravel deposited by a small unnamed tributary stream in the East Branch Pleasant River basin. Probably of Holocene age in large part, but may include an early postglacial component.

Stream terrace deposit - Gravel terrace on southeast side of West Branch Pleasant River. Deposited by the river in early postglacial time.

Fan deposits - Alluvial fans on east side of Keewaydin Lake and in the Wild Brook valley.

Eolian deposit - Small sand deposit of inferred windblown origin on west side of Crooked River valley.

Glacial Lake Bethel deposits - Sand and gravel deposited in a glacial lake in the Pleasant River valley. This lake extended into the Androscoggin River valley to the north and was controlled by one or more spillways at ~690 ft elevation.

Glacial Lake Mill Brook deposits - Sand and gravel deposited in or graded to a glacial lake in the Mill Brook valley. Lake level was controlled by a spillway southeast of Ingham Hill, at ~710 ft elevation.

Glacial Lake Pleasant deposits - Sand and gravel deposited in a glacial lake in the Pleasant River basin. Lake level was controlled by a spillway southwest of Browns Ledge, at ~830 ft elevation.

Ice-contact deposits - Miscellaneous sand and gravel deposits formed in contact with remnants of stagnant glacial ice in the Meadow Brook, Albany Brook, New England Brook, Pattie Brook, Walker Brook, and Mill Brook valleys. May include glacial-stream and glacial-lake sediments. Kettles, hummocks, and collapse structures occur locally.

Crooked River outwash deposits - Sand and gravel. Outwash deposited by glacial meltwater streams in the Crooked River valley.

Crooked River ice-contact deposits - Sand and gravel. Deposited adjacent to remnants of stagnant glacial ice in the Crooked River valley. Locally collapsed and kettled from melting of supporting ice.

Outwash deposit - Small sand deposit on north side of Keewaydin Lake. Inferred to have been deposited by a glacial meltwater stream.

Glacial Lake Waterford deposits - Sand, gravel, and silt deposited in a glacial lake controlled by a spillway at Kezar Falls gorge in the North Waterford quadrangle.

Esker deposits - Sand and gravel deposited by meltwater streams in subglacial tunnels.

End moraine deposit - Ridge of bouldery till deposited at the glacier margin when it stood along the south side of Keewaydin Lake.

Till - Loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt, and gravel-size rock debris deposited by glacial ice. Locally includes lenses of waterlaid sand and gravel.

Bedrock outcrops/thin-drift areas - Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick (mapped partly from air photos). Gray areas and dots show individual outcrops.

Contact - Boundary between map units. Dashed where very approximate.

Scarp - Scarp separating adjacent terrace levels in sand and gravel deposits. Symbol also shows walls of large meltwater channel at south edge of quadrangle.

Glacially streamlined hill - Symbol shows trend of long axis, which is parallel to former glacial ice-flow direction.

135 **Glacial striation locality** - Arrow shows ice-flow direction inferred from striations on bedrock. Dot marks point of observation. Number is azimuth (in degrees) of flow direction. Flagged arrow (where shown) is older ice-flow direction.

Dip of cross-bedding - Arrow shows average dip direction of cross-bedding in fluvial or deltaic deposits, which indicates direction of stream flow or delta progradation. Point of observation at dot.

Meltwater channel - Channel eroded by glacial meltwater stream or drainage from glacial lake. Arrow shows inferred direction of former stream flow. "Ptmw" is spillway for glacial Lake Mason in Speckled Mountain quadrangle.

k **Kettle** - Topographic depression formerly occupied by a block of melting glacial ice.

>>>>> **Crest of esker** - Shows trend of esker ridge. Chevrons point in direction of meltwater flow.

Area of many large boulders, where observed. May be more extensive than shown.

Crest of end moraine - Symbol indicates till ridges in the East Stoneham area which are inferred to be end moraines.

Ice-margin position - Shows an approximate position of the glacier margin during ice retreat, based on meltwater deposits, moraines, and/or positions of meltwater channels.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Thompson, W. B., 2003, Surficial geology of the East Stoneham 7.5-minute quadrangle, Oxford County, Maine: Maine Geological Survey, Open-File Report 03-4, 11 p.

2. Thompson, W. B., and Locke, D. B., 2003, Surficial materials of the East Stoneham quadrangle, Maine: Maine Geological Survey, Open-File Map 03-1.

3. Thompson, W. B., 2001, Deglaciation of western Maine, *in* Weddle, J. K., and Retelle, M. J., eds., Deglacial history and relative sea-level changes, northern New England and adjacent Canada: Geological Society of America, Special Paper 351, p. 109-123.

4. Neil, C. D., 2003, Significant sand and gravel aquifers of the East Stoneham quadrangle, Maine: Maine Geological Survey, Open-File Map 03-3.

5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.